Name: Date:

Polynomial Factoring solution (version 685)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 48 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(48)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 192}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-48}}{2}$$

$$x = \frac{12 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{12 \pm 4\sqrt{3}\,i}{2}$$

$$x = 6 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 - 2i$ and $-4 - 9i$ in standard form $(a + bi)$.**

Solution

$$(-3 - 2i) \cdot (-4 - 9i)$$

$$12 + 27i + 8i + 18i^2$$

$$12 + 27i + 8i - 18$$

$$12 - 18 + 27i + 8i$$

$$-6 + 35i$$

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3. **Write function $f(x) = x^3 - x^2 - 4x + 4$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	-1	-4	4
-2		-2	6	-4
	1	-3	2	0

$$f(x) = (x + 2)(x^2 - 3x + 2)$$

$$f(x) = (x + 2)(x - 2)(x - 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 7)^2 \cdot (x + 2) \cdot (x - 3) \cdot (x - 8)^2$$

Sketch a graph of polynomial $y = p(x)$.